

## **AI Assisted Coding**

### **Lab-6.3**

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**Batch – 06**

## Lab 6: AI-Based Code Completion – Classes, Loops, and Conditionals

Week: 3

Day: Wednesday

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### Lab Objectives

- To explore AI-powered code completion for Python classes, loops, and conditionals.
- To understand how AI suggests object-oriented and control-flow logic.
- To evaluate AI-generated code for correctness, readability, and completeness.

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### Lab Outcomes

After completing this lab, students will be able to:

- Generate Python classes and methods using AI tools.
- Analyze loop logic suggested by AI.
- Evaluate conditional statements generated by AI.
- Critically assess AI-assisted Python code.

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### **Task Description #1: Classes (Student Class)**

#### Scenario

Develop a simple student information management module.

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## AI-Generated Python Code

```
class Student:
```

```
    def __init__(self, name, roll_number, branch):
```

```
        self.name = name
```

```
        self.roll_number = roll_number
```

```
        self.branch = branch
```

```
    def display_details(self):
```

```
        print("Student Name:", self.name)
```

```
        print("Roll Number:", self.roll_number)
```

```
        print("Branch:", self.branch)
```

```
# Object creation
```

```
student1 = Student("Preetham", 101, "CSE")
```

```
student1.display_details()
```

```
<untitled> *X
1 class Student:
2     def __init__(self, name, roll_number, branch):
3         self.name = name
4         self.roll_number = roll_number
5         self.branch = branch
6
7     def display_details(self):
8         print("Student Name:", self.name)
9         print("Roll Number:", self.roll_number)
10        print("Branch:", self.branch)
11
12
13 # Object creation
14 student1 = Student("Preetham", 101, "CSE")
15 student1.display_details()
16 |

Shell x
>>> %Run -c $EDITOR_CONTENT
Student Name: Preetham
Roll Number: 101
Branch: CSE
>>>
```

---

## Output

Student Name: Preetham

Roll Number: 101

Branch: CSE

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## Analysis of AI-Generated Code

- The AI correctly created a class with a constructor (`__init__`).
- Attributes are clearly named and easy to understand.
- The `display_details()` method neatly prints student information.
- Code is readable, correct, and well-structured.

Conclusion: AI-generated code is accurate and suitable for beginner-level programs.

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## Task Description #2: Loops (Multiples of a Number)

Scenario

Display the first 10 multiples of a given number.

---

Using a for Loop


```
def print_multiples(num):  
    for i in range(1, 11):  
        print(num * i)
```

```
print_multiples(5)
```

**Output**

```
5  
10  
15  
20  
25  
30  
35  
40  
45  
50
```

---

```
<untitled> 
1 def print_multiples(num):
2     for i in range(1, 11):
3         print(num * i)
4
5 print_multiples(5)
6

Shell X
>>> %Run -c $EDITOR_CONTENT
5
10
15
20
25
30
35
40
45
50
>>>
```

Using a while Loop

```
def print_multiples_while(num):
```

```
    i = 1
```

```
    while i <= 10:
```

```
        print(num * i)
```

```
        i += 1
```

```
print_multiples_while(5)
```

---

## Comparison & Analysis

Feature	for Loop	while Loop
Readability	High	Medium
Best Use	Fixed iterations	Condition-based
Complexity	Simple	Slightly more

Both approaches work correctly, but the for loop is more concise.

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### Task Description #3: Conditional Statements (Age Classification)

Scenario

Classify people based on age.

---

Using Nested if-elif-else

```
def classify_age(age):  
    if age < 13:  
        return "Child"  
    elif age < 20:  
        return "Teenager"  
    elif age < 60:  
        return "Adult"  
    else:  
        return "Senior"
```

```
print(classify_age(25))
```

**Output**

Adult

```
<untitled> * X
1 def classify_age(age):
2     if age < 13:
3         return "Child"
4     elif age < 20:
5         return "Teenager"
6     elif age < 60:
7         return "Adult"
8     else:
9         return "Senior"
10
11 print(classify_age(25))
12

Shell X
>>> %Run -c $EDITOR_CONTENT
Adult
>>>
```

---

### Alternative Approach (Simplified Conditions)

```
def classify_age_simple(age):
    categories = {
        range(0, 13): "Child",
        range(13, 20): "Teenager",
        range(20, 60): "Adult",
        range(60, 150): "Senior"
    }

    for age_range, label in categories.items():
        if age in age_range:
            return label
```

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### Explanation

- if-elif-else is easier for beginners.
- Dictionary-based logic is compact but slightly advanced.

- AI-generated conditions are logically correct and well-ordered.

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### Task Description #4: For and While Loops (Sum of First n Numbers)

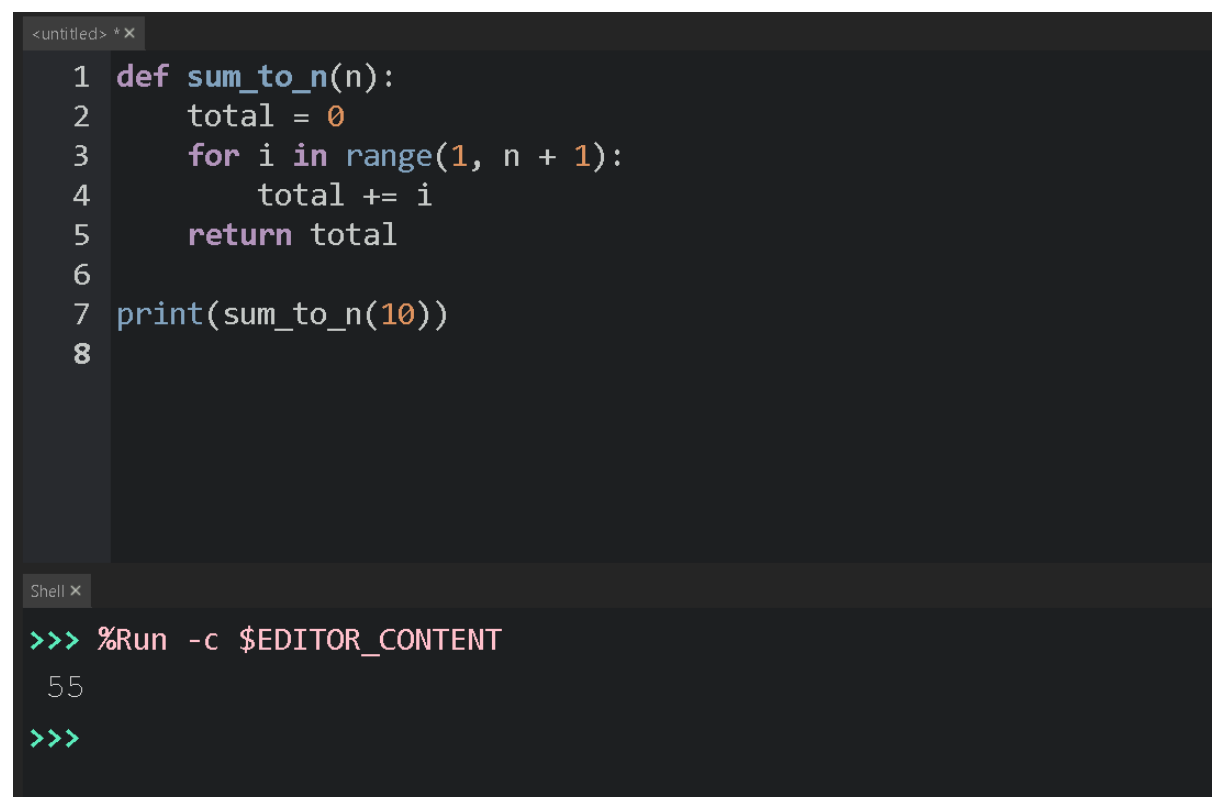
Using a for Loop

```
def sum_to_n(n):  
    total = 0  
    for i in range(1, n + 1):  
        total += i  
    return total
```

```
print(sum_to_n(10))
```

### Output

55



The screenshot shows a code editor window titled "<untitled> \* x" containing the following Python code:

```
1 def sum_to_n(n):  
2     total = 0  
3     for i in range(1, n + 1):  
4         total += i  
5     return total  
6  
7 print(sum_to_n(10))  
8
```

Below the code editor is a terminal window titled "Shell x". It shows the command `>>> %Run -c $EDITOR_CONTENT` being executed, followed by the output `55` and a prompt `>>>`.

---

Using a while Loop



```
def sum_to_n_while(n):
```

```
    total = 0
```

```
    i = 1
```

```
    while i <= n:
```

```
        total += i
```

```
        i += 1
```

```
    return total
```

---

Using Mathematical Formula

```
def sum_to_n_formula(n):
```

```
    return n * (n + 1) // 2
```

---

Comparison

Method	Performance	Complexity
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for loop	Good	Easy
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while loop	Good	Medium
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Formula	Best	Very Simple
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AI correctly suggested multiple valid solutions.

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## Task Description #5: Classes (Bank Account Class)

Scenario

Design a basic banking application.

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AI-Generated Bank Account Class

```
class BankAccount:
```

```
    def __init__(self, account_holder, balance=0):
```

```
self.account_holder = account_holder  
self.balance = balance
```

```
def deposit(self, amount):  
    self.balance += amount  
    print("Deposited:", amount)
```

```
def withdraw(self, amount):  
    if amount <= self.balance:  
        self.balance -= amount  
        print("Withdrawn:", amount)  
    else:  
        print("Insufficient balance")
```

```
def check_balance(self):  
    print("Current Balance:", self.balance)
```

# Object creation

```
account = BankAccount("Preetham", 1000)  
account.deposit(500)  
account.withdraw(300)  
account.check_balance()
```

---

## Output

Deposited: 500

Withdrawn: 300

Current Balance: 1200

```
<untitled> * X
1 class BankAccount:
2     def __init__(self, account_holder, balance=0):
3         self.account_holder = account_holder
4         self.balance = balance
5
6     def deposit(self, amount):
7         self.balance += amount
8         print("Deposited:", amount)
9
10    def withdraw(self, amount):
11        if amount <= self.balance:
12            self.balance -= amount
13            print("Withdrawn:", amount)
14        else:
15            print("Insufficient balance")
16
17    def check_balance(self):
18
Shell X
>>> %Run -c $EDITOR_CONTENT
Deposited: 500
Withdrawn: 300
Current Balance: 1200
>>>
```

---

## Explanation

- Constructor initializes account holder and balance.
- deposit() increases balance.
- withdraw() checks balance before deducting.
- check\_balance() displays current balance.
- AI-generated logic is safe, clear, and realistic.

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## Overall Conclusion

- AI tools effectively generate Python code for classes, loops, and conditionals.
- Generated code is correct, readable, and efficient.
- Human analysis is still required to ensure clarity, edge-case handling, and optimization.

